

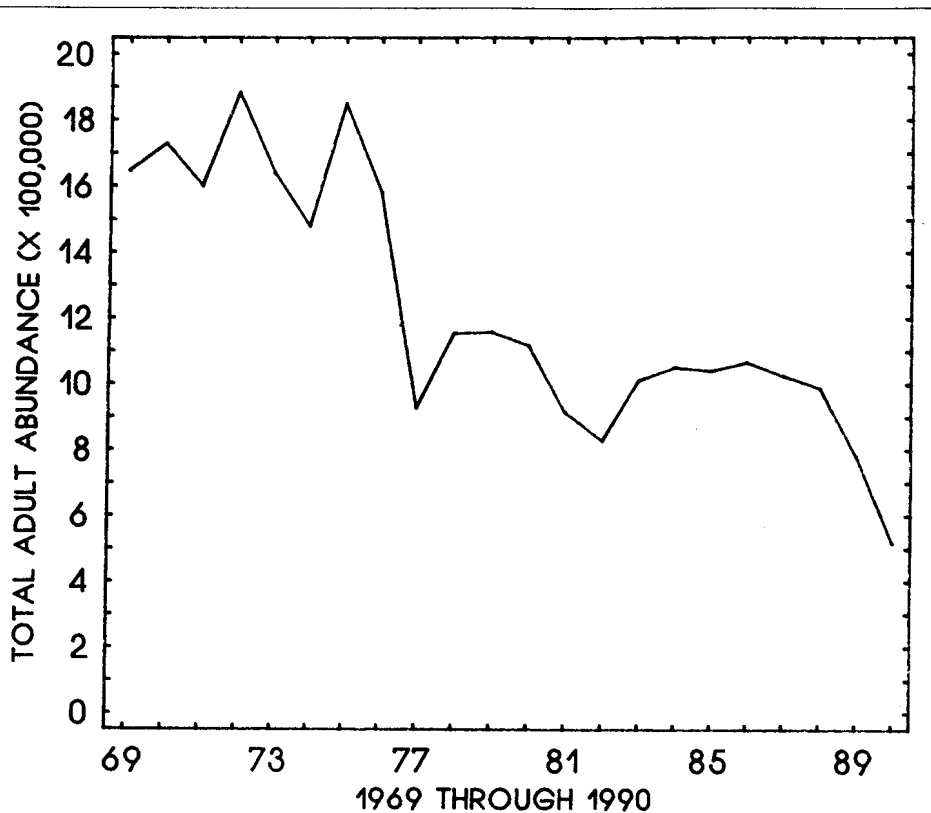
Readers are encouraged to submit brief articles or ideas for articles. Correspondence, including requests for changes in the mailing list, should be addressed to Randy Brown, California Department of Water Resources, 3251 S Street, Sacramento, CA 95816-7017.

## Striped Bass

A few items of interest regarding the striped bass population in the Sacramento-San Joaquin estuary ...

- Initial Peterson estimates for 1990 indicate the number of legal size (18 inches or larger) striped bass fell to a record low. This estimate will be adjusted as more information becomes available, but a statistical evaluation indicates the population has almost certainly fallen below previous levels. As shown in the figure, the current estimate of about 500,000 striped bass represents a decline from about 800,000 to 1.2 million during the past decade and from 1.6 to 1.9 million during the early 1970s. The population decline has been caused primarily by a decline in the number of new fish reaching the legal size of 18 inches, rather than by an increase in mortality of adult fish. Estimates of the abundance of 3- and 4-year-old fish, the youngest and most numerous component of the adult population, were at record lows in 1990. For example, the estimate of about 250,000 3-year-olds contrasts with more than a million 3-year-olds in several years and the lowest previous estimate of about 380,000.

- The State Water Contractors funded Chuck Hanson to conduct intensive surveys of striped bass eggs and larvae in the Sacramento River between Sacramento and the Delta Cross Channel. These surveys, conducted in early May after a



TREND IN ABUNDANCE OF ADULT STRIPED BASS IN THE SACRAMENTO-SAN JOAQUIN ESTUARY FROM 1969-1990

spawning peak was detected at Bryte, were to follow movement of eggs and larvae through this stretch during low flows.

(A theory is that at low flows, water velocities are so low that eggs and larvae settle out and perish.) The study was to be part

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of an Interagency effort (USBR and DFG) to track egg and larval movement during a 4-day period of pulsed flow. For a variety of reasons, including a court injunction, the pulse flow study was cancelled. Sorting samples and identifying eggs and larvae captured in Hanson's program are now underway. A final report is expected by September 1. If available, results will be summarized in the September *Newsletter*.

- Early indications are that the striped bass summer tow-net index will be low again this year. Preliminary data from USBR's continuous samplers show a couple of spawning peaks but a fairly continuous low level of spawning throughout the season.
- In cooperation with DFG, DWR stocked about 2.5 million yearling striped bass this May and June. The stocking program was initiated in 1988 in accordance with a 1986 agreement to offset direct losses of fish at the State Water Project's Delta Pumping Plant. This year's bass were stocked in the lower Sacramento River and San Pablo Bay. We estimate 400,000 to 500,000 of these fish will survive to become adults over the next 3 years — about the same number as the existing adult population. With this latest stocking, DWR's mitigation program has provided about 4.5 million yearling equivalent striped bass since 1988. This is about 1 million more than have been lost at the pumping plant since 1986. DWR and DFG have agreed to stock another 2 million yearling bass next year.
- As a result of discussions between anglers' organizations (United Anglers and California Striped Bass Association) and the State Water Contractors, DFG's Central Valleys Hatchery at Elk Grove will remain in operation during FY 1991-92. Funding will be from DFG's drought legislation or from DWR. (DWR is processing a contract in the event the drought legislation isn't enacted.) During the next fiscal year, the Elk Grove Hatchery will provide young striped bass for various DFG and university studies. The

long-term fate of the hatchery will be the focus of discussions during FY 1991-92.

- Under a separate contract, DWR is providing funds for DFG's Elk Grove staff to sort and grade juvenile striped bass salvaged from the SWP Delta fish protective facilities. About 280,000 of these 1- to 2-inch-long fish will be provided to two

private fish farmers for growing to yearlings. The yearlings will be released into the estuary next May. The DWR 4-Pumps mitigation account will be credited for the number released minus the calculated number of yearlings that would have been expected to have survived in the wild.

## San Francisco Estuary Project's Regional Monitoring Strategy

The San Francisco Estuary Project is sponsoring an effort to develop a regional monitoring strategy for the estuary. The impetus for this strategy comes from language in the Clean Water Act that requires each National Estuary Project to devise a mechanism to track the success of management activities undertaken as part of the final Comprehensive Management Plans. The SFEP Technical Advisory Committee has formed a workgroup to address this mandate. To ensure that the monitoring strategy is developed with adequate input from the Interagency Program, the workgroup includes Jim Arthur (*USBR*), Bellory Fong, and Harlan Proctor (*both DWR*).

The workgroup is basing its approach to the monitoring issue on several recent publications, including the 1990 report by the National Research Council on the status of marine monitoring, EPA's recent *Monitoring Guidance Document* (June 1991), and work being done in the Santa Monica Bay Restoration Project to develop a regional monitoring approach. Key elements of this approach include an emphasis on "top down" goal and objective setting and provision of early opportunities for scientists and managers to come together and agree on program objectives.

The workgroup was recently briefed by scientists from Puget Sound and Santa Monica on aspects of each region's monitoring program. Jim Arthur also briefed the group on the Interagency Program Water Quality/Zooplankton Monitoring Review Committee efforts to apply the NRC's recommen-

dations in the process of revising that element of Decision 1485 monitoring.

The SFEP has contracted with Tetra Tech, Inc., Aquatic Habitat Institute, and Eco-Analysts to help develop the regional monitoring strategy. The strategy will build on past regional monitoring development efforts, with the dual aims of improving integration of ongoing monitoring in the region and strengthening overall understanding of the health of the estuary. Throughout its development, the strategy will rely on and interact with important programs such as the Interagency Program.

The SFEP mandate is to create and implement a comprehensive management plan that focuses on five major issues: dredging, pollutants, flows, biological resources, and land use. The regional monitoring strategy will, therefore, address all five areas of concern. Because of the amount of knowledge obtained through Interagency work over the past 20 years, establishing a strong link with the Interagency Program will be essential for successful implementation of the SFEP regional monitoring strategy. The workgroup will look to Interagency members for input and cooperation throughout the effort. The schedule calls for a Regional Monitoring Goals workshop in August. Details of the strategy will be under development during 1992, and the project and final SFEP management plan are scheduled to be completed in November 1992. For more about this project, please contact Judy Kelly at the Regional Water Quality Control Board in Oakland (415/464-3985).  
— Judy Kelly, EPA

### Recent Publications

- Observations on Temporal and Spatial Variability of Striped Bass Eggs and Larvae and Their Food in the Sacramento-San Joaquin River System.* Technical Report 27, Robert Fujimura, DFG, June 1991. Contact Mary at 916/323-7203 for a copy.
- Selective Predation by Larval Striped Bass on Native and Introduced Copepods.* Lesa Meng and Jim Orsi. *Trans. Amer. Fish. Soc.* 120(2), March 1991. Contact Lesa Meng at Wildlife and Fisheries Biology, UC-Davis 95616, regarding availability of reprints.
- Potamocorbula amurensis: Comparison of Clearance Rates and Assimilation Efficiencies for Phytoplankton and Bacterioplankton.* Technical Report 29, Tim Hollibaugh and Inge Werner, Tiburon Center for Environmental Studies, April 1991. Contact Mary at 916/323-7203 for a copy of the abstract. For those who need more information, a few copies are available.

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## Fish Facilities Staff Changes

In July, Dan Odenweller and Barry Collins will leave the Interagency Program for new assignments within DFG.

After 17 years on the Fish Facilities Program, Dan will report July 1 to Inland Fisheries, where he will work on the water diversion/fishway (fish screen) component of the Central Valley Anadromous Fisheries Enhancement Program.

On July 8, Barry will leave after 7 years on the Fish Facilities Program to become project leader for the natural stock assessment element of the Klamath-Trinity Program.

Dan and Barry have made major contributions in evaluating impacts of State Water Project Delta facilities on fish and providing biological design criteria for new facilities. We wish Dan and Barry continued success in their new assignments.

DFG will be filling these and other approved positions in the Fish Facility Program as soon as possible. Perry Herrgesell will assume leadership in the meantime.

Important program elements handled by the Fish Facilities Section in DFG's Stockton office are predation studies in Clifton Court Forebay, an expanded test program, and fish counting and hauling at DWR's Skinner Fish Facility.

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## Entrapment Zone Workshops

The San Francisco Estuary Project is finalizing plans for a 3-day workshop in late August to discuss the entrapment zone. The project has contracted with Dr. Jerry Schubel, State University of New York at Stonybrook, to facilitate the workshop and provide workshop proceedings. The overall goal is to determine if we know enough about the biological importance of the entrapment zone to adopt management strategies. Several Interagency staff members will be attending the "by-invitation-only" workshop and sharing the findings with the Coordinators and technical committees.

Scientists from the Chesapeake Bay and Columbia River estuaries have also been invited to attend.

The Interagency Food Chain Group and Hydrodynamic Technical Committee are also planning a 1-day workshop on the entrapment zone. The Interagency meeting will focus more on understanding chemical, biological, and physical processes associated with the entrapment zone, rather than the Estuary Project's emphasis on short-term management actions. A date has not yet been set for the Interagency workshop.

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## Noteworthy —

- Johnson Wang has completed a first draft of a report describing the early life history of Delta smelt, with comparisons to early life stages of longfin smelt. For his analyses, Dr. Wang used samples collected by DFG, DWR, and USBR. Using Dr. Wang's "key", biologists will be able to readily separate early life stages of the two smelt species, which are often found together in the upper estuary. The report should be available late this summer.

- Plans for this fall's Estuarine Research Federation meeting are falling into place. According to Program Coordinator Jim Cloern, this may be the largest meeting yet. About 550 papers will be presented, and several local researchers will be presenting papers at the poster session. Program schedules for the November 10-14 meeting will be available about October 1.

- Modifications were made to DWR's 25-foot *Beowulf II* to allow its use for sampling striped bass eggs and larvae in the southern Delta. Similar modifications to the *San Carlos* and *Scrutiny* (on loan to DWR from USBR) for towing nets will permit greater integration of Interagency field work.

- DFG announced that effective July 1, the Stockton office will be elevated within the organization to the Bay/Delta and Special Water Projects Division. Bay/Delta was formerly a branch within the Inland Fisheries Division. Pete Chadwick will continue to head the organization as Division Chief.

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## Staff Notes —

- Dale Sweetnam, a DFG Fisheries Biologist, will transfer from the striped bass project to work on Delta smelt. He will be working with Interagency staff, the USFWS endangered species staff, university researchers, and consultants to expand from a pilot study to the full-scale program.

- Chuck Armor was recently promoted to the senior level. His section consists of the Zooplankton/Water Quality Unit headed by Jim Orsi and the Delta Outflow/San Francisco Bay Study headed by the also newly promoted Kathy Hieb.

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## Director of Mid-Pacific Region Leaving

USBR recently announced that Larry Hancock, Director of the Mid-Pacific Region, will be moving to Washington, DC, to become Assistant Commissioner. Roger Patterson, presently Regional Director in Billings, Montana, will be moving to Sacramento to direct the Mid-Pacific Region. USBR expects the changes in responsibilities to be completed by about August 1.

## Unit of the Month — DWR's Compliance Monitoring and Analysis Section BAY/DELTA UNIT

To protect beneficial uses of Delta waters, Decision 1485 established water quality standards, export limitations, and minimum flow rates for state and federal water project operations. The decision included a comprehensive monitoring program to ensure compliance with the mandated standards and to determine if objectives of the Delta Water Quality Control Plan were being met. It also required preparation of a plan of protection for Suisun Marsh to maintain the brackish water environment of this valuable resource. DWR's monitoring responsibility lies with the Compliance Monitoring and Analysis Section. The section has three units: Bay/Delta, Suisun Marsh, and Control Systems Maintenance. We'll cover the Bay/Delta Unit this time, and the Suisun Marsh and Control Systems Maintenance units next issue.

The Bay/Delta Unit, in collaboration with USBR, is responsible for monitoring and special study requirements specified in Decision 1485. The study area extends from San Pablo Bay to Freeport on the Sacramento River and to Vernalis on the San Joaquin River and is monitored at 26 locations. About 30 physical, chemical, and biological parameters are included. Sampling runs are usually aboard the *San Carlos*, a 56-foot vessel uniquely equipped for discrete as well as continuous automated monitoring. Numerous analyses are completed on board, and prepped samples are transported to DWR's Chemical Laboratory in West Sacramento for analysis. The more remote areas are reached by a mobil laboratory van or a smaller boat.

Sampling frequency depends on outflows, but runs are typically every other week from March through October and once a month from November through February. During alternate weeks, the *San Carlos* sweeps through the study area conducting continuous water quality profile runs using automated recording instruments. This scheduling provides a weekly surveillance of the system and better documentation of short-term water quality changes.

Field measurements are supplemented by a network of six remote, multiparameter, on-shore water quality monitors. Measurements are continuous, and all data are recorded and stored on-site by a digital control system. Some sites are equipped with radio telemetry, and selected mea-

surements are transmitted to the California Data Exchange Center in Sacramento. This information allows a daily assessment of conditions used by operations, planning, and flood management personnel.

The Bay/Delta Unit is frequently asked to participate in studies that extend beyond the routine monitoring. The introduction of new species; changes in patterns of growth, accumulation, and species composition of estuarine phytoplankton; impacts resulting from the current drought situation; and local response to modified water project

operations have required expansion of the program.

Information produced by these programs is subjected to a quality assurance edit and accuracy check before uploading to the federal National Computer Center, which provides access to the data through EPA's storage and retrieval system, STORET. A local reference library of data files is being established in cooperation with SWRCB that will allow a user to directly request specific information in a variety of electronic formats.

### Our Staff

- Harlan Proctor, Environmental Program Manager I, is Chief of the Compliance Monitoring and Analysis Section. Harlan is responsible for compliance with monitoring and reporting requirements of *Decision 1485* and the *Suisun Marsh Plan of Protection*. He has a BS in Sanitary Sciences, School of Public Health, UC-Berkeley.
- Steve Hayes, Environmental Specialist IV, is Unit Chief and ensures that Decision 1485 compliance and special studies monitoring is completed and that the data are verified, analyzed, and reported. Steve has a BS in Biology from College of William and Mary, an MS in Biology from University of the Pacific, and a PhD in Ecology (aquatic emphasis) from UC-Davis. He is also a Navy veteran.
- Peggy Lehman, Environmental Specialist IV, has a BS in Renewable Natural Resources and an MS and PhD in Ecology from UC-Davis. Peggy's post-doctoral training was in oceanography and plant physiology. Her specialty is phytoplankton ecology, and her focus is on environmental and biological processes that affect production at the base of the estuarine food chain. She conducts data analyses, designs special studies, develops statistical models, and is a member of the Interagency Food Chain Group.
- Zachary Hymanson, Environmental Specialist III, has a BS in Biological Sciences from UC-Davis and an MS in Marine Sciences from San Francisco State University. Zach's work focuses on the biology and ecology of the San Francisco Bay estuary. Most recently, he has been examining the ecological role of the entrapment zone and investigating the effects of introduced species such as *Potamocorbula amurensis*. Zach is chairman of the Interagency Striped Bass Food Chain Group.
- John Baker, Associate Water Quality Biologist, is involved with contract management, compliance water quality monitoring, and servicing field equipment. John has a BS in Zoology from UC-Davis and an MS in Biology from CSU-Sacramento.
- Shig Katsumata, Water Resources Technician II, is the technical crewperson for water quality monitoring, editing and verifying water quality data, and maintaining equipment inventories and records of field data.
- Kitty Triboli, Water Resources Technician II, is the technical crewperson for water quality monitoring, editing and verifying water quality data, and spectrophotometric analyses of chlorophyll. She has an AA from American River College.
- Lloyd Brenn, Chief Engineer, Fisheries Vessel, is the primary skipper of the monitoring vessels *San Carlos* and *Beowulf II*. Lloyd is responsible for basic maintenance of the vessels and for day-to-day operation of the Antioch field station. Lloyd holds marine operator licenses authorizing him to operate a variety of vessels up to 300 tons.

*The Aquatic Habitat Institute  
and the  
San Mateo County Office of Education  
present*

# *Teaching About the San Francisco Bay and Delta*

*November 9, 1991 – Optional Field Trips, November 10 and 11  
California Academy of Sciences, San Francisco*

The conference will feature symposia, workshops, and naturalist-led excursions out to the Bay. Goals of the conference are to provide educators with tools to effectively teach about the estuary and to spark a greater interest in teaching about the Bay and Delta.

## **Conference Highlights for Saturday, November 9**

- » *Environmental Issues Facing the San Francisco Bay and Delta*  
Barry Nelson, Save San Francisco Bay Association
- » *Dancing on the Brink of the World: The Bay Area Prior to the Arrival of Europeans*  
Malcom Margolin
- » *What About Mud? Dredging in San Francisco Bay*  
Joseph O'Connor, Ph.D., Aquatic Habitat Institute
- » *Wetlands Activities for the Classroom*  
Hayward Shoreline Interpretive Center
- » *Hands-On Activities; Teaching About the Bay*  
Patty Donald, City of Berkeley Shorebird Nature Center
- » *Additional Lectures: Restoration Ecology in Action, Kids in Creeks, The California Endangered Species Program, Action-Oriented Education for the 90's, Using Computers to Teach Ecology, and more!*

## **Highlights for Field Trips on November 10 and 11**

- » *Kayak the Bay!*  
Paddle and explore the wonders of the Bay on a full-day trip to Angel Island. No experience necessary. Educators, mates, and children over 13 welcome.  
Conducted by Environmental Traveling Companions (Etc).
- » *Learn Science By Doing Science*  
Take a discovery voyage out onto the Bay and learn about ichthyology, physical oceanography, plankton, and benthic ecology. Educators, mates, and children over 10 welcome.  
Conducted by the Marine Science Institute.
- » *Rocky Shore, Docks and Piers*  
Become a Bay scientist by participating in hands-on activities, including fish printing and belly biology. Educators, mates, and children of all ages welcome.  
Conducted by the City of Berkeley Shorebird Nature Center.
- » *Mudflats and Salt Marshes*  
Introduction to the ecology of mudflats and saltmarshes using hands-on, field-oriented activities.  
Conducted by the Hayward Shoreline Interpretive Center.

Academic units available.  
For more information, call Kathy Kramer at 415/231-9539.

Interagency Ecological Studies Program  
*NEWSLETTER*  
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Interagency Ecological Studies Program for the Sacramento-San Joaquin Estuary

# *NEWSLETTER*

California Department of Water Resources  
State Water Resources Control Board  
U.S. Bureau of Reclamation

A Cooperative Effort of:

U.S. Army Corps of Engineers

California Department of Fish and Game  
U.S. Fish and Wildlife Service  
U.S. Geological Survey

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